

JAPANESE

[JP,09-139915,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD  
 PRIOR ART EFFECT OF THE INVENTION TECHNICAL  
 PROBLEM MEANS DESCRIPTION OF DRAWINGS  
 DRAWINGS CORRECTION OR AMENDMENT

[Translation done.]

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

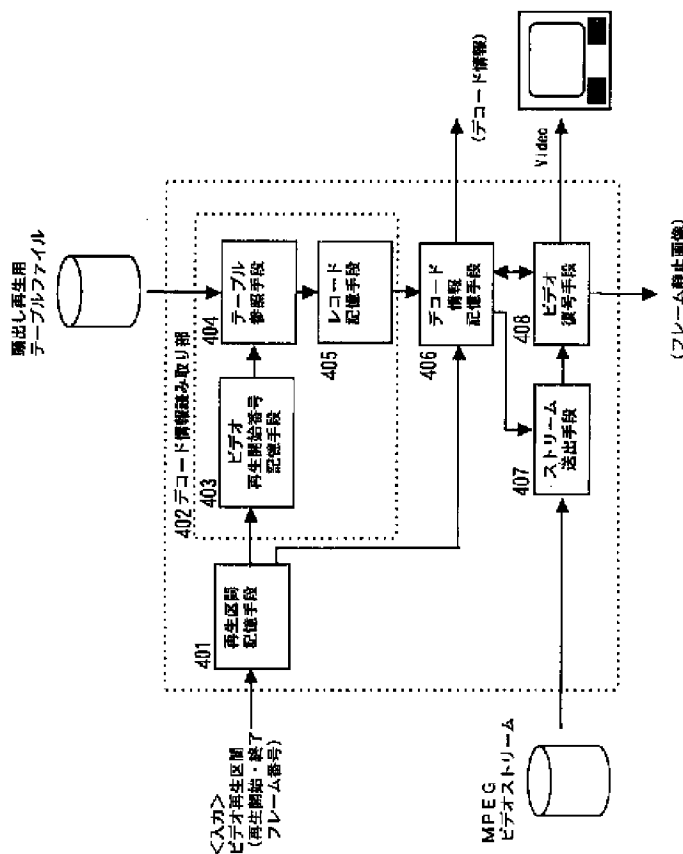
[Field of the Invention]This invention relates to the compression video simple editing device for providing compression video decoding and playback equipment for searching and perusing the contents of accumulation digital compression dynamic image data at high speed, and the method of searching and perusing accumulation digital compression dynamic image data without futility easily.

[0002]

[Description of the Prior Art]Maintenance of the environment where dynamic image information can be dealt with easily has come to be desired with improvement in graphical-data-compression algorithm hardware, and the large scale and improvement in the speed of memory storage. In order to require time equal [ data volume of dynamic image information is huge, and ] to the record time of the dynamic image information in order to peruse and retrieve all the information, in providing a user with a dynamic image data base, it is also necessary to combine and to provide suitable search and reading means.

[0003]There is a video search method of JP,2-113790,A considering the contents of video as one of the search methods. this extracting as a scene the portion of dynamic image information with which the feature of a retrieval picture is expressed for every retrieval picture unit in the method of searching dynamic image information, and editing as a menu image what collected scenes -- the retrieval picture of a menu image to the purpose -- search -- it is a video search

Drawing selection Representative draw



[Translation done.]

method characterized by things. If an image is divided like this example bordering on the portion from which the contents of the image change and the list display of the representation still picture in each scene is carried out by making into a scene the range of the image which continued contents-wise and semantically, a retrieving person and a visitor can grasp the contents of video easily. However, that the scene by viewing carves and editing work, In order to require serious time and effort and time, a dynamic image processor of JP,5-236449,A, Many scene change sensing device and methods, such as a scene conversion part detecting method of the animation editing processing of the provisional-publication-of-a-patent No. 89545 [ Heisei 6 to ] gazette and a video scene sensing device of the provisional-publication-of-a-patent No. 236439 [ Heisei 6 to ] gazette, are proposed.

[0004]However, although these scene change detecting methods detect the portion from which image contents change a lot using the inter-frame correlation which mainly adjoins, There is still an insufficient field in detecting accuracy, and, under the present circumstances, it can be said that automatic scene change detection is an auxiliary means of the editing work of dynamic image information. With an edited image, even if the adjoining frame changes a lot, the direction which it considered that was one scene in semantic and contents, and had carried out index attachment is considered [ that it may be easy to use and ] for end users, such as a retrieving person and a visitor. Namely, the list display of the index picture created from the automatic scene change detection result is not carried out as it is, It is more desirable to provide a user with the index information on an animation stream, after an editor adds a suitable correction of integration of deletion of an index, and two or more indexes, an addition of an index, etc. if needed. For that purpose, a means to edit the result of automatic scene change detection is required.

[0005]It is desirable that it makes into an index picture the scene head image obtained by scene change detection and not only carries out a list display, but it can perform immediately moving image reproduction from an index picture in which the user did arbitrary specification. The broadcast reception record playback equipment of JP,6-105280,A reproduces program information immediately by reproducing the infanticide picture of the recorded program information and choosing program information from the infanticide picture. In order to search the picture in the compression video file corresponding to an infanticide picture with this device, the address with which each infanticide picture is recorded is recorded, the decoding start position of compression dynamic image data can be determined with reference to this address, and moving image reproduction can be performed immediately. However, in this method, in order to be able to perform only instant replay which begins from an infanticide picture but to perform instant replay of an arbitrary specification frame, the address information about all the frames is needed. The frame formed into the frame inner code is included in the stream represented by MPEG which is international standards of a video coding mode, In the compression video of the interframe-predictive-coding method with which the code for random access is inserted. a decoding start frame number and a

decoding start stream position -- and, Display start frame number information is required, further, a video stream audio stream is packet-ized and the position information which starts system separation is also needed by the MPEG system stream which multiplexes this and is made into one stream.

[0006]The instant replay methods of other compression video include the video coding equipment of JP,6-326998,A. In this device, in order that the reproduction and fast reproduction from the middle may perform video coding data smoothly and simply, (It is prescribed by MPEG) Value insertion was carried out and the method of reading the start position for which a difference with a actual start position is shown in the position of beginning made into the target of GOP and which is made into the target of GOP at the time of decoding is taken. Although it is not necessary to analyze an MPEG video stream per byte and the beginning of GOP can be accessed at high speed in this method, a special encoder is required and it cannot apply to the MPEG stream and MPEG system stream which were created with other encoders.

[0007]In the picture reproducer of JP,6-54292,A. In order to be able to acquire still picture information from a dynamic image data base, the method of memorizing all in an animation sequence or the position of arbitrary I pictures (frame formed into the frame inner code) as still picture position information is taken. In this device, it is characterized by not preparing the still picture file for carrying out a list display to an inspection / search of video apart from dynamic image data. As a problem of this method, although it is possible to decode and display the specific frame which are only video compression streams and still picture position information, and is contained in the animation at high speed, it is mentioned that the image of I picture is not necessarily a frame suitable for grasp of the contents of video. Any shall be chosen between the method of creating the still picture file for list displays beforehand and the method of decoding a desired still picture from dynamic image data according to a still picture display requirement should determine in consideration of the storage capacity of a database, the performance of a compression video decoding device, the response time to a user, etc.

It cannot generally be said that which is excellent.

[0008]A dynamic image data base also requires the text-based search means by a keyword. In the cine mode display device of JP,6-162116,A. It is what provides the easy cine mode display device which can search and display desired data out of a lot of dynamic image data accumulated by performing prediction coding of an MPEG system, Bibliographic information is embedded as an user datum into an MPEG stream, and it can search now using this bibliographic information. This bibliographic information is text-based information, including the title of the dynamic image data added via the help, contents, regeneration time length, etc. In this method, although the search by a keyword is possible, to add further the function where visual search and inspection can do contents of an animation like an index picture list display for the check of search results is desired.

[0009]

[Problem(s) to be Solved by the Invention]It is necessary to provide suitable search and reading means in the dynamic image data base which accumulated compression video to the end user which performs search and an inspection. As this search and reading means, the frame image which the contents of an animation changed a lot by automatic scene change detection is extracted, and there is the method of carrying out the list display of this. This method is an effective means which can create the index information which recorded the scene change detection result automatically without an information provider applying time and effort, and can perform the grasp of the contents of an animation with a momentary user.

However, since the present automatic scene change detection is not what was carved according to image contents, there is an insufficient field. In order to provide the index information which compensates this and does not have excess and deficiency, the means which carries out the reorganization collection of the index information created automatically easily is required. Like an index picture list display, not only the means that searches and peruses the contents of one compression video stream visually but a text-based search means to search a desired stream and the scene in a stream from two or more compression video streams is also required.

[0010]According to the purpose, the reorganization collection of two or more compression video streams in a compression dynamic image data base may be carried out, and an end user may be provided with this. However, the compression video of the interframe-predictive-coding method represented by MPEG which is international standards of a video coding mode, When treating the data which multiplexed the compressed data of the video audio like an MPEG system stream, and was made into one stream, with a compression video stream, the reorganization collection of a frame unit has restriction. Therefore, in order to make an edit result into a new compression video stream, highly efficient video coding equipment and decoding device are needed. Since the storage capacity of only that is needed when saved as a stream new whenever it carries out a reorganization collection, It is thought that it is desirable for an image to be renewable as an edit result as for the reorganization collection stream which does not need to be saved in the long run, and the reorganization collection stream with low frequency in use if there is only a file which recorded only compilation information.

[0011]There are some which were mentioned above as a function which a compression dynamic image data base has, and when it is which at the time of search and an inspection of a database at the time of the reorganization collection of index information, the instant replay function from an arbitrary specification frame is required as one of the important user interfaces. When not asking the time required to a reproduction start, how to search for a decoding start position in the code analysis from a stream head, the method of determining a seek amount suitably based on the total frame number and a specification frame number, and detecting a decoding start position in successive approximations, etc. can be considered. In order to shorten the time required to a reproduction start as much as possible, a frame number and the correspondence relation of the decoding start position of a stream must be defined beforehand. In

the compression video stream of a fixed-length-coding method. If the coding length of one frame understands, the random access of a frame unit is possible, and if the address is recorded for every frame in the compression video of the frame inner code-sized method of variable length coding, the random access of a frame unit is possible. On the other hand, in the data which multiplexed the compression video stream and video audio stream of an interframe-predictive-coding method like MPEG, and was made into one stream. The random access method in consideration of the point of performing compression over two or more frames, and the point which the video audio has multiplexed of a special frame unit is required.

[0012]This invention is what solves above SUBJECT, Like the compression video of the interframe-predictive-coding method represented by MPEG which is international standards of a video coding mode, or an MPEG system stream. Compression video decoding and a display which has a high-speed search function for the data which multiplexed the compressed data of the video audio and was made into one stream, And it aims at providing the compression video simple editing device using this compression video decoding and display into which compression video can be edited in simple.

[0013]

[Means for Solving the Problem]In compression video decoding and a display of this invention, . Corresponded to an MPEG video stream and an MPEG system stream. Have a table preparing means for search reproduction which can determine a decoding start position in a stream, and a reproduction starting position from a frame number, and a created table for search reproduction is used, A search reproduction means from a specification frame which performs moving image reproduction from a specification frame, Index image decoding and a displaying means which displays a still picture of a scene head frame as an index image based on a scene change detection result file indicated in a predetermined format, A search reproduction means from an index image arbitrarily selected out of an index image which carried out the list display to an index image list display function which carries out the list display of the index image by index image decoding and a displaying means is provided.

[0014]A compression video simple editing device of this invention has a function equivalent to the above-mentioned compression video decoding and display, An index image restoration means by which a scene change result is checked using an index picture list display function, a search regenerative function, etc., and an index picture can be changed, deleted and added, A scene change result correcting means which can correct a scene change detection result file in connection with index image restoration, A simple-edit-information file creation means to create a file which recorded information for reproducing an image connected in order of a request of two or more scenes of a multi-file, Compression video decoding and a displaying means which can reproduce two or more scenes of two or more compression video streams in order of specification based on a simple-edit-information file created by a simple-edit-information file creation means, A keyword registration means for search by which a variable-length keyword for search can be added to a header of a table for search reproduction, and a keyword for search can be added

to each scene information in a scene change detection result file is provided.

[0015]

[Embodiment of the Invention]The reproducing section memory measure which the invention of this invention according to claim 1 memorizes reproduction start / end frame number of the specified compression video stream, and outputs this, The decode information reading means which reads information required for search reproduction and outputs this with reference to the table for search reproduction currently created beforehand, The decode information memory measure which summarizes the output of a reproducing section memory measure, and the output of a decode information reading means, and memorizes this, The stream delivery means which seeks a compression video stream based on decode information, and starts stream sending out from the position, The compression video stream sent out from a stream delivery means is decoded according to decode information, The function which will start graphic display if a reproduction start frame is reached, and will end decoding and graphic display further if the end frame of reproduction is reached, . And have a video decoding means with the function which carries out a frame still picture output when a playback start and an end are the same values. The table for search reproduction corresponding to the interframe-predictive-coding compression video stream which has inserted the code for random access including the predictive coding data in a frame into the stream which are compression video decoding and a display and has been created beforehand is used, Regardless of a stream position, it has the operation that the high-speed search reproduction from the arbitrary specification frame in which the search time required is almost constant, and specified interval reproduction are possible.

[0016]The reproducing section memory measure the invention of this invention according to claim 6 remembers reproduction start / end video frame number to be, The reproducing section memory measure which memorizes reproduction start / end audio frame number, reading the table for search reproduction corresponding to the MPEG system stream currently created beforehand -- a video frame -- or, The decode information reading means which reads information required for search reproduction and outputs this according to the search reproduction instruction on the basis of an audio frame, The decode information memory measure which summarizes the output of a reproducing section memory measure, and the output of a decode information reading means, and memorizes this, A compression video stream is sought based on the decode information memorized by the decode information memory measure, The stream delivery means which sends out the video audio packet which carried out system separation one by one after outputting the pack header information data read in the stream to a decode information memory measure, the function which decodes the video stream received from the stream delivery means, will start graphic display if a reproduction start frame number is reached, and will end decoding and graphic display further if the end frame of reproduction is reached -- and, The BIBIDEO decoding means which has a function which carries out a frame still picture output

when a reproduction start and an end are the same values, The audio decoding means which will start audio reproduction if the audio stream received from the stream delivery means is analyzed and a decoding start frame is reached, and will end decoding further if the end frame of reproduction is reached, . Have a synchronous reproduction means to take the synchronization of video audio reproduction based on the information memorized by the decode information memory measure. . Corresponded to the MPEG system stream which is international standards of video coding. It is compression video decoding and a display, and the table for search reproduction currently created beforehand is used, and it has the operation that the high-speed search reproduction from the arbitrary specification frame in which the search time required is almost constant, and specified interval reproduction are possible, regardless of a stream position.

[0017]The invention of this invention according to claim 15 reads the scene change detection result file of the predetermined format on which the frame number of the head frame of each scene in a compression video stream is recorded, The scene change information storage means which outputs an index picture list display command, The still picture outputted one by one from search refreshable compression video decoding and a displaying means, and search refreshable compression video decoding and a displaying means is reduced, The index picture list display means which carries out the list display of this, and a reproducing section determination means to determine the reproducing section corresponding to the arbitrarily selected index picture with reference to scene change information out of the index image group by which the list display is carried out, They are compression video decoding and the display which has a display information control means which distinguishes a video section reproduction instruction and an index list display command, and controls display information, Without creating an index graphics file beforehand, the list display of the index picture created from the compression video stream is carried out, and it has the operation that moving image reproduction from the arbitrarily selected index picture can be performed.

[0018]The video reproducing section memory measure which memorizes two or more continuous index pictures chosen from the index picture to which the list display of the invention of this invention according to claim 18 is carried out as one video reproducing section, A reproduction sequence determination means to determine the reproduction sequence of the set-up video reproducing section, It is considered that the video reproducing section which the video reproducing section memory measure has memorized is one scene, It is a compression video simple editing device which has a simple-edit-information file creation means which extracts the head frame number and final frame number of a scene, aligns based on the reproduction sequence the reproduction sequence determination means has remembered this to be, and is made into simple edit information, It has the operation that the simple-edit-information file which provides end users, such as an inspection and a retrieving person, with the deep image of the contents which deleted the unnecessary portion can be created without creating the new compression video stream as an edit result.

[0019]Hereafter, an embodiment of the invention is described using drawing 24 from drawing 1.

(Embodiment 1) Drawing 1 is a table preparation device for compression video stream search reproduction. The video stream of MPEG this [ whose ] is international standards of video coding for the interframe-predictive-coding compression video stream which has inserted the code for random access including the predictive coding data in a frame into the stream also corresponds. Here, it explains that a compression video stream is an MPEG video stream.

[0020]The table preparation device for compression video stream search reproduction of drawing 1 comprises a chord detecting means, a frame number calculating means and a header information preparing means, and a table preparing means. Each part in drawing 1 is explained in order. The GOP code used as the standard of the random access which 101 reads a compression video stream and is included in a stream, It is a chord detecting means which detects the picture code etc. which are added to the head of each coded frame one by one, and memorizes the position in the stream of the GOP code. 102 is a frame number calculating means which outputs the accumulation frame number of a just before [ each GOP code ] whenever it counts the number of the picture codes detected by the chord detecting means 101 and the GOP code is detected. 103 is a header information preparing means which creates the header which indicated the total frame number, regeneration time, the parameter at the time of decoding, etc. based on the output of the chord detecting means 101 or a frame number calculating means. 104 is a table file preparing means which creates the table for search reproduction and is outputted as a file using the output of the chord detecting means 101, the frame number calculating means 102, and the header information preparing means 103.

[0021]Operation of the table preparation device for compression video stream search reproduction of the above composition is explained. First, detection of the GOP code and a picture code is performed in the chord detecting means 101. The chord length of the GOP code and a picture code is 4 bytes. The stream is analyzed per 4 bytes, the buffer of suitable length being in the chord detecting means 101, reading a compression video stream into this, and shifting a pointer per byte. The parameter at the time of decoding included in the sequence layer of an MPEG video stream, etc. are memorized if needed.

[0022]In the chord detecting means 101, when the GOP code and a picture code are detected, 4 bytes of pointer indicating an analysis position is shifted. At the time of picture code detection, a picture code detecting signal is sent to a frame number calculating means. Since pictures include I, P, and B picture, the signal which distinguished these may be sent if needed. On the other hand, in the frame number calculating means 102, whenever it receives a picture code detecting signal from the chord detecting means 101, the frame number is counted up.

[0023]In the chord detecting means 101, when the GOP code is detected, From the chord detecting means 101, the GOP code detecting signal is sent to the frame number calculating means 102, and it can come to it, simultaneously the offset number of bytes from



a stream head to a GOP code position is outputted to the table preparing means 104. In connection with this, the frame number calculating means 102 outputs the accumulation frame number from the stream head to the GOP code to a table preparing means. In the table preparing means 104, a record is created by making an accumulation frame number and the offset number of bytes from a stream head to a GOP code position into a lot, and it adds to the table file one by one. And if the termination of a stream is checked in the chord detecting means 101, a stream analysis terminate signal will be sent to the frame number calculating means 102, the header information preparing means 103, and the table preparing means 104. In a header information preparing means, the total frame number etc. which are memorized by the parameter at the time of decoding memorized by the chord detecting means 101 and the frame number calculating means 102 are summarized according to the format which was able to be defined beforehand, and this is outputted as header information. In a table preparing means, header information is added to a table file and processing is ended.

[0024]However, although it counted up the frame number whenever the frame number calculating means 102 received the picture code detecting signal from the chord detecting means 101, and it presupposed that the accumulation frame number from the stream head to [ from the stream head ] the GOP code is computed in the above-mentioned explanation, It is good also as what computes an accumulation frame number using information, including TC (Time Code) in a GOP header, TR (Temporal Reference) in a picture header, etc.

[0025]Table 1 is an example of the table file for MPEG video stream search reproduction. In this example, 4 bytes is prepared for the accumulation frame number record section in the offset number-of-bytes (it abbreviates to offset number of bytes hereafter) record section from 3 bytes and the stream head to the GOP code. This quota number of bytes may be changed according to the length of the compression video stream to deal with.

[0026]

[Table 1]

累積 フレーム数 (3バイト)	ストリーム先頭から GOPコードまでの オフセットバイト数 (4バイト)
0	12
15	3127
30	11058
45	32805
60	57246
75	98232
90	142350
105	190038
:	:
:	:

[0027]As an example, the MPEG video stream search regeneration method using the table file of Table 1 from the 100th frame is

explained. First, the record which investigates the numerical value of the accumulation frame number record section of a table file sequentially from the top, and becomes 100 or more values is looked for. The record which becomes larger than 100 is the 8th 105, and the offset number of bytes of the record is 190038 bytes. If the GOP code will exist in the position and this will start decoding from the GOP code, if 190038 bytes of stream is sought, and it displays, it means being reproduced from the 106th frame (since 105 frames will exist by just before the GOP code). That is, in order to play from the 100th frame, the record in front of [ of a table file ] one must be referred to. An accumulation frame number is [ 90 and the offset number of bytes of the record in front of one ] 142350. Then, 142350 bytes of stream is sought and decoding is started from the GOP code of the position. However, the display of a decoding picture is not immediately performed. The frame number of the frame which started decoding is 91. A display will be started, if the frame number is counted from here and the 100th frame is reached.

[0028] Thus, the table file for search reproduction of Table 1, The interframe-predictive-coding compression video stream which has inserted the code for random access including the predictive coding data in a frame into the stream, When performing reproduction from the middle, it is for performing high-speed search reproduction from the reproduction start frame which used that decoding had to be started and was specified from the code (an MPEG video stream the GOP code) for random access. The variable length area which indicates the title of a stream and the object for search for keywords is prepared into a header at a table file, and it may enable it to use for the video stream search in a database.

[0029] Drawing 2 is a table preparation device for MPEG system stream search reproduction. This extends the table preparation device for compression video stream search reproduction of drawing 1, and is made to correspond to the MPEG system stream which the video stream and the audio stream have multiplexed. Here, although the target compression video stream is made into an MPEG system stream, it is possible for it to be also adapted for a multiplexed stream similar to this.

[0030] The table preparation device for MPEG system stream search reproduction of drawing 2 comprises a system-code detection means, a video stream analysis means, an audio stream analysis means, and a table preparing means. Each part in drawing 2 is explained in order. The pack start code which 201 reads an MPEG system stream and is contained in a stream, And it is a system-code detection means to detect a packet start code, to memorize the stream position of those codes, and to send out the video packet which carried out system separation, and an audio packet. 202 is a video packet analysis means to analyze two or more video packets sent out from the system-code detection means 201 as one video stream. 203 is an audio packet analysis means to analyze two or more audio packets sent out from the system-code detection means 201 as one audio stream. 204 is a table preparing means which creates the table for search reproduction based on the output from the video packet analysis means 202 and the audio packet analysis means 203. The video packet analysis means 202 comprises a chord detecting means

in a video packet, a number calculating means of video frames, a video stream information storage means, and a record preparing means for video search playback. 205 is a chord detecting means in a video packet which detects the video packet containing the picture code which analyzes two or more video packets sent out from a system-code detection means as one video stream, and is contained in a stream, and the GOP code. 206 counts the number of the picture codes detected by the chord detecting means 205 in a video packet, It is the number calculating means of video frames which outputs the accumulation frame number of a just before [ each GOP code ], and the number of picture codes after the GOP code in a packet whenever the GOP code is detected. 207 is a video stream information storage means which memorizes the parameter at the time of video stream decoding memorized in the chord detecting means 205 in a video packet, and information, including the total frame number etc. Whenever the video packet which contains the GOP code in the chord detecting means in a video packet is detected, 208, It is a record preparing means for video search playback which an offset number of bytes and the relative-offset number of bytes from a pack header to a packet header are absolutely summarized from the number of packet inner frames, an accumulation frame number, and a stream head to a pack header, and creates the record for video search playback.

[0031]The audio packet analysis means 203 comprises a chord detecting means in an audio packet, an audio frame counting means, an audio stream information storage means, and a record preparing means for audio search playback. 209 is a code analysis means in an audio packet to analyze two or more audio packets sent out from the system-code detection means 201 as one audio stream, and to detect the AAU (Audio Access Unit) header in a packet. 210 is the number calculating means of audio frames which counts the number of the AAU header codes detected by the chord detecting means 209 in an audio packet, and outputs the accumulation AAU number of just before each audio packet code, and the AAU number in a packet. 211 is an audio stream information storage means which memorizes the parameter at the time of audio stream decoding memorized by the chord detecting means 209 in an audio packet, and information, including the total frame number etc. In the chord detecting means in an audio packet, whenever one packet analysis is completed, 212, From the number of packet inner frames (AAU), the number of accumulation frames (AAU), and a stream head to a pack header, absolutely An offset number of bytes, It is a record preparing means for audio search playback which summarizes the relative-offset number of bytes from a pack header to a packet header, and creates the record for audio search playback.

[0032]Operation of the table preparation device for MPEG system stream search reproduction of the above composition is explained. First, in the system-code detection means 201, detection of a pack header code and a packet header code is performed. The chord length of a pack header code and a packet header code is 4 bytes. The stream is analyzed per 4 bytes, a system-code detection means having a buffer of the suitable length for an inside, reading an MPEG system stream into this, and shifting a pointer per byte. When the GOP code and a picture code are detected, 4 bytes of pointer

indicating an analysis position is shifted. The stream position of a pack start code and the stream position of a packet start code are memorized, and the information in a system header is outputted to the table preparing means 204. In the system-code detection means 201, if a video packet header is detected, a video packet will be sent out to the video packet analysis means 202, and if an audio packet header is detected, an audio packet is sent out to the audio packet analysis means 203. The relative-offset number of bytes from the pack start code of the pack in which an offset number of bytes and each packet belong to the pack start code of the pack in which each packet belongs from a stream head to each packet start code is also absolutely outputted with packet sending out. These two offset numbers of bytes are memorized in the video packet analysis means 202 or the audio packet analysis means 203.

[0033]Here, operation of the video packet analysis means 202 is explained. The video packet analysis means 202 analyzes from the system-code analysis means 201 by considering that the video packet sent out one by one is one video stream. However, the chord detecting means 205 in a video packet is judged to be a thing belonging to a front packet, when analysis which was conscious of the packet boundary is conducted and the GOP code and the picture code are divided by two packets. The relative-offset number of bytes from the pack start code of the pack in which an offset number of bytes and a packet belong to the pack start code of the pack in which each packet belongs from a stream head to a packet start code is memorized absolutely.

[0034]In the chord detecting means 205 in a video packet, when a picture code is detected, a picture code detecting signal is transmitted to the number calculating means 206 of video frames. Since pictures include I, P, and B picture, the signal which distinguished these may be sent if needed. On the other hand, in the number calculating means 206 of video frames, whenever it receives a picture code detecting signal, the frame number is counted up.

[0035]In the chord detecting means 205 in a video packet, when the GOP code is detected, The GOP code detecting signal is transmitted to the number calculating means 206 of video frames, To the pack start code of the pack in which it can come, simultaneously a packet belongs from a stream head to the record preparing means 208 for video search playback, absolutely An offset number of bytes, The relative-offset number of bytes from the pack start code of the pack in which a packet belongs to each packet start code is outputted. In connection with this, the number calculating means 206 of video frames outputs the accumulation frame number of a just before [ the GOP code ], and the number of picture codes which exists after the GOP code in the packet containing GOP to the record preparing means 208 for video search playback. The record preparing means 208 for video search playback creates the record for video search playback by making into a lot an offset number of bytes, a frame number, etc. which have been sent, and outputs it to the table file preparing means 204 one by one.

[0036]The number of picture codes which exists after the GOP code in the packet in which the record for video search playback contains GOP (henceforth) The accumulation frame number from the stream

head abbreviated to the number of packet inner frames to just before the GOP code, An offset number of bytes and the relative-offset number of bytes from a pack start code to a packet start code are absolutely made into a lot from a stream head to a pack start code, and it is created only to the packet containing the GOP code.

[0037]The video stream information storage means 207, It is for memorizing information, including the parameter at the time of video stream decoding received from the chord detecting means 205 in a video packet, the total frame number received from the number calculating means 206 of video frames, etc., and these are indicated in the header of a table file.

[0038]Here, operation of the audio packet analysis means 203 is explained. The audio packet analysis means 203 analyzes from the system-code analysis means 201 by considering that the audio packet sent out one by one is one audio stream. However, the chord detecting means 209 in an audio packet is judged to be a thing belonging to a front packet, when analysis which was conscious of the packet boundary is conducted and the AAU header code is divided by two packets. The relative-offset number of bytes from the pack start code of the pack in which an offset number of bytes and a packet belong to the pack start code of the pack in which each packet belongs from a stream head to a packet start code is memorized absolutely.

[0039]In the chord detecting means 209 in an audio packet, when an AAU header code is detected, an AAU header detecting signal is sent to the number calculating means 210 of audio frames. On the other hand, in the number calculating means 210 of audio frames, whenever it receives an AAU header detecting signal, the frame number is counted up.

[0040]After the analysis of one packet is completed, in the chord detecting means 209 in an audio packet the chord detecting means 209 in an audio packet, To the pack start code of the pack which sends a packet-analysis terminate signal to the number calculating means of audio frames and in which each packet belongs from a stream head to the record preparing means for audio search playback, absolutely An offset number of bytes, The relative-offset number of bytes from the pack start code of the pack in which each packet belongs to each packet start code is outputted. In connection with this, the number calculating means 210 of audio frames outputs the accumulation AAU number from a stream head to the end of an object packet, and the AAU number in a packet to the record preparing means 212 for audio search playback. (However, an accumulation AAU number may be defined as the AAU number from a stream head to just before a packet code.) The record preparing means 212 for audio search playback, A record is created by making into a lot an offset number of bytes, an AAU number, etc. which have been sent, and it outputs to the table file preparing means 204 one by one.

[0041]The record for audio search playback The AAU number in a packet, an accumulation AAU number, An offset number of bytes and the relative-offset number of bytes from a pack start code to a packet start code are absolutely made into a lot from a stream head to a pack start code, and it is created to all the audio packets.

[0042]The audio stream information storage means 211, It is for

memorizing information, including the parameter at the time of audio stream decoding received from the chord detecting means 209 in an audio packet, the total frame number received from the number calculating means 210 of audio frames, etc., and these are indicated in the header of a table file.

[0043]the table file preparing means 204 -- the record preparing means 204 for video search playback -- and, The identifier which distinguishes a video audio is added to the record for search playback sent from the record preparing means 212 for audio search playback, and this is added to it one by one at the table file.

[0044]And in the system-code detection means 201, a check of the termination of a stream will send a stream analysis terminate signal to the video packet analysis means 202, the audio packet analysis means 203, and the table preparing means 204. If this signal is received, the table preparing means 204 will receive the information memorized by the system-code detection means 201, the video stream information storage means 207, and the audio stream information storage means 211, will create a header, and will add this to a table file.

[0045]Table 2 is an example of the table file for MPEG system stream search reproduction. In this example, to 1 bit and the number of packet inner frames at a video audio identifier 7 bits, 2 bytes is absolutely prepared for the accumulation frame number from 3 bytes and a stream head to a pack header at the relative-offset number of bytes from 4 bytes and a pack header to a packet header at the offset number of bytes. This quota number of bytes may be changed according to the length of the MPEG system stream to deal with. In the case of video, the number of packet inner frames in Table 2 means the number of picture codes which exists after the GOP code in the packet containing GOP, and, in the case of an audio, the AAU number in a packet is meant.

[0046]

[Table 2]

識別子	パケット内 フレーム数	累積 フレーム数	ストリーム先頭から バックヘッダまでの 絶対オフセットバイト数 (バックヘッダの 絶対位置) (4バイト)	バックヘッダから パケットヘッダまでの 相対オフセットバイト数 (パケットヘッダの 相対位置) (2バイト)
(1ビット)	(7ビット)	(3バイト)	(4バイト)	(2バイト)
0	1	0	0	30
1	14	14	0	2078
1	13	27	55422	2060
1	13	40	92358	2060
1	13	53	123138	4108
0	1	32	135450	12
1	13	66	166230	2060
1	13	79	203166	12
1	13	92	246258	2060
0	1	62	277038	4108
:	:	:	:	:
0	1	28292	137408094	2060
0	1	28322	137555838	12

識別子 0 : ビデオ  
1 : オーディオ

[0047]A video stream and an audio stream are packet-ized, and the packet multiplexes an MPEG system stream, and it is one stream. Therefore, when performing search playback from the middle, the starting position of the system separation of a video audio must be determined. In the search reproduction on the basis of a video frame, the GOP code becomes with the rule of thumb of a system separation starting position. Then, it decided to have a packet code position of the packet containing GOP as a record for video search playback. Although an MPEG system stream summarizes some packets, adds a header to this and is considering it as the pack, there is a key objective of a pack in making possible synchronous decoding reproduction of the video audio from the stream middle. In the pack header, information, including SCR (System Clock Reference, system time standard reference value) etc., is included. Then, in consideration of referring to the information in a pack header, it divides into an offset number of bytes and the relative-offset number of bytes from a pack header to a packet header from a stream head to a pack header absolutely, and the offset number of bytes is recorded. However, when not performing audio reproduction simultaneously with video recovery, or when strict video audio synchronous reproduction is not required, it is not necessary to use the information in a pack header. In this case, only an offset number of bytes will be absolutely recorded to the packet which contains the GOP code from a stream head.

[0048]If such a table file for search reproduction is created to the MPEG system stream, search reproduction on the basis of a video frame and search reproduction on the basis of an audio frame can be performed at high speed. Among Table 2, since it is data which does not necessarily have necessity, the number for video search playback of packet inner frames may not be recorded. However, as for the record length of a video audio record, arranging is preferred.

[0049]Table 3 is an example of the header of the table file for search reproduction. The AAU header in a table file header, a system header, and a sequence header are reproduced from an MPEG system stream. Since decode parameters required at the time of the search reproduction from the stream middle are contained, these are recorded into a table header. If this information is seen, the feature of an MPEG system stream can also be checked.

[0050]

[Table 3]

略称	内容	バイト数	備考
HEAD_CODE	テーブルヘッダコード	4バイト	
HEAD_LEN	テーブルヘッダ長	2バイト	テーブルヘッダのバイト数
Name_Len	ファイル名サイズ	2バイト	StreamName のバイト数
StreamName	ストリームファイル名	可変長	
vp_cnt	ストリーム中のビデオパケット数	2バイト	
gop_cnt	ストリーム中のGOP数	2バイト	
pic_cnt	ストリーム中のピクチャ数	2バイト	
ap_cnt	ストリーム中のオーディオパケット数	2バイト	
aa_u_cnt	ストリーム中のAAU数	2バイト	
aa_u_head	AAUヘッダ	4バイト	
SysHead_Len	システムヘッダ長	2バイト	
SysHead	システムヘッダ	可変長	システムヘッダを複製
SeqHead_Len	シーケンスヘッダ長	2バイト	
SeqHead	シーケンスヘッダ	可変長	シーケンスヘッダを複製
Ext_Len	拡張領域サイズ	2バイト	Extend のバイト数
Extend	拡張領域	可変長	

[0051]Although the table for search reproduction will be beforehand created for search reproduction, Since it is not necessary to decode all streams and can create only by start code detection, as compared with record time length, table creation is possible at ultrashort time amount, and it becomes a file of small capacity very much as compared with a compression video stream. If it includes in an encoder, it is also possible to carry out simultaneous creation at the time of encoding. It may add to the head of a compression video stream by making a table file into a user code, and the table reading function for search reproduction may be added to a decoder.

[0052]Drawing 3 is a decode information reader of an MPEG system stream. Using the table for search reproduction created with the table preparation device for MPEG system stream search reproduction of drawing 2, this is for acquiring decode information required at the time of search, and is included in search refreshable compression video decoding and a display. It precedes explaining search refreshable compression video decoding and a display, and a decode information reader is explained. (Since it is the almost same composition as the decode information reader of an MPEG system stream, the decode information reader of an MPEG video stream is omitted again.)

The decode information reader of drawing 3 comprises a video recovery start number memory measure, an audio reproduction start number memory measure, a table reference means, and a record memory measure. Each part in drawing 3 is explained in order. The video recovery start number memory measure which memorizes the video recovery start frame number as which 301 is inputted from the outside, and 302, The audio reproduction start number memory measure which memorizes the audio reproduction start frame number inputted from the outside, and 303, reading the table file for search reproduction and referring to this -- the video recovery start number memory measure 301 -- or, The stream seeking number of bytes for performing reproduction from the frame of the reproduction start number memorized by the audio reproduction start number memory measure 302, A table reference means to determine the record for search playback in which the decoding start frame



number is recorded, and 304 are record memory measures which memorize the record determined by the table reference means 303, and output this. The video recovery start number memory measure 301 and the audio reproduction start number memory measure 302 are not used simultaneously.

[0053]Operation of the decode information reader of the above composition is explained. First, the decode information reading process on the basis of a video frame is explained using the flow chart of drawing 4. The outline of each step of this flow chart is described. In Step 101 (in a drawing, it is the same as that of S101, the notation, and the following), the reproduction start frame number memorized by the video recovery start number memory measure 301 is read. In Step 102, the record memory buffer which memorizes the record in a table file referred to is initialized. Two record memory buffers are prepared into the table reference means 303, and they are used in order to memorize the record under present reference, and the record which was being referred to before one. Two buffers will be called a current record memory buffer and a front record memory buffer. The record to memorize comprises an offset number of bytes and a relative-offset number of bytes from a pack header to a packet header absolutely from the video audio identifier shown in Table 2, the number of packet inner frames, an accumulation frame number, and the stream head to the pack header. In Step 103, one already read record of the table file for search playback is read into a current record memory buffer. In Step 104, the video audio identifier in a current record memory buffer is checked, and it is judged whether it is a video search record. When it is not a video search record, it returns to Step 103 and the next record in a table is read into a current record memory buffer. In Step 104, when judged with video search record \*\*\*\*, it moves to Step 105 and the value which added 1 to the playback start frame number and the accumulation frame number in a current record memory buffer is compared. Since it means that what is necessary is just to perform decoding and a display according to its record when this is in agreement, it moves to Step 108, the record in a current record memory buffer is determined as a reference record, and a record is outputted to the table storing means 304 of drawing 3 in Step 108. In Step 105, from a reproduction start frame number, one to the accumulation frame number in a current record memory buffer when the applied value is small, Since it means not having reached yet the record which should be referred to, in Step 109, the contents of the current record memory buffer are reproduced to a front record memory buffer, it returns to Step 103, the next record in a table is read, and processing is continued. In Step 105, from a reproduction start frame number, one to the accumulation frame number in a current record memory buffer when the applied value is large, Since it means having passed over the record which should be referred to, it progresses to Step 106, a front record memory buffer is determined as a reference record, and a record is outputted to the table storing means 304 of drawing 3 in Step 107. The reference record in a table file is determined by such a flow.

[0054]The reference record decision process in the table file at the time of performing video search playback from the 50th frame is

explained using the example of the table file for MPEG system stream search playback of Table 2. The value of the video audio identifier in the table file of Table 2 skips the search record for audios paying attention to 0, i.e., the record for video search playback. The record for video search playback is created only to the packet containing the GOP code. The table file is seen sequentially from the top and the record in which an accumulation frame number becomes 50 or more is looked for. In the case of Table 2, it is the 4th record from the bottom. As for the accumulation frame number of this record, the relative-offset number of bytes from 277038 bytes and a pack header to a packet header of an offset number of bytes is 4108 bytes absolutely from 62 and a stream head to a pack header. Since this has a pack header code and has a packet header of the packet which contains GOP in the position further sought 4108 bytes from there when 277038 bytes of system stream is sought, If system separation is started from there and decoding is started from GOP which exists in the packet, it means being reproduced from the 63rd frame. That is, in order to perform reproduction from the 50th frame, decoding must be started from GOP in front of one. Then, if the record for video search playback in front of one is referred to, the relative-offset number of bytes from 135450 bytes and a pack header to a packet header of the accumulation frame number is [ the offset number of bytes ] 12 bytes absolutely from 32 and the stream head to the pack header. Since this record is a record required for the search playback from the 50th frame, a stream will be sought with reference to this and search playback will be performed.

[0055]Next, the stream seek amount calculating process on the basis of an audio frame is explained. Although a stream seek amount is determined by the table reference means 302, the stream seek amount calculating process on the basis of an audio frame (a frame means AAU) is shown in the flow chart of drawing 5. The outline of each step is described according to this flow. In Step 201, the reproduction start frame number memorized by the audio reproduction start number memory measure 302 is read. In Step 202, the record memory buffer which memorizes the record in a table file referred to is initialized. The record which this record memory buffer is prepared into the table reference means 303, and is memorized, It comprises an offset number of bytes and a relative-offset number of bytes from a pack header to a packet header from the video audio identifier shown in Table 2, the number of packet inner frames, an accumulation frame number, and the stream head to the pack header absolutely. Among these, an accumulation frame number means the accumulation frame number (AAU number) to the packet which has been applicable from the stream head. In Step 203, one already read record of the table file for search playback is read into a record memory buffer. In Step 204, the video audio identifier in a current record memory buffer is checked, and it is judged whether it is a record for audio search playback. When it is not a record for audio search playback, it returns to Step 203 and the next record in a table is read into a record memory buffer. In Step 204, when judged with audio search record \*\*\*\*, it moves to Step 205. In Step 205, from the accumulation frame number and the number of packet inner frames in a record memory buffer, the range of the frame which

exists in a packet is searched for, and let this be a packet inner frame range. In Step 206, it is judged whether a reproduction start frame number is compared with the packet inner frame range, and the specified reproduction start frame is in a packet. When judged with there being nothing into a packet, it returns to Step 203 and the next record of a table file is read. In Step 206, when judged with the specified playback start frame being in a packet, the record in a record memory buffer is made into a reference record in Step 207, and the record of a step 208 smell lever is outputted. The reference record in a table file is determined by such a flow.

[0056]The reference record decision process in the table file at the time of performing audio search reproduction from the 50th frame is explained using the example of the table file for MPEG system stream search reproduction of Table 2. The value of the video audio identifier in the table file of Table 2 skips the search record for videos paying attention to 1, i.e., the record for audio search playback. The table file is seen sequentially from the top and the record in which an accumulation frame number becomes 50 or more is looked for. In the case of Table 2, it is the 5th record from a top. As for 13 and an accumulation frame number, the relative-offset number of bytes from 123138 bytes and a pack header to a packet header of an offset number of bytes is [ number of packet inner frames of this record ] 4108 bytes absolutely from 53 and a stream head to a pack header. If 123138 bytes of system stream is sought, this has a pack header code, and the position further sought 4108 bytes from there has a packet header, and it means the 41st to the 53rd thing for which frame existence is recognized in the packet. Therefore, what is necessary is just to perform decoding and reproduction from the 50th frame that exists in the packet.

[0057]If the table for search reproduction created with the search table preparation device of MPEG system stream correspondence of drawing 2 and the decode information read-out device of drawing 3 are used, in order to reproduce video from the specified frame, the stream position which should start decoding can be determined at high speed. And compression video decoding and the display in which the high-speed search reproduction from an arbitrary frame is possible are realizable by building the decode information read-out device of drawing 3 into compression video decoding and a display.

[0058]Drawing 6 is a lineblock diagram of compression video decoding and the display corresponding to an MPEG video stream. This comprises a reproducing section memory measure, a decode information reading part, a decode information memory measure, a stream delivery means, and a video decoding means. However, these each part, the whole control means which controls each means, a means to change the decoded frame image into a video signal, etc. are omitted. (Related with the following figures the same.) Each part in drawing 6 is explained in order. 401 is a reproducing section memory measure which memorizes the reproduction start frame number inputted from the outside, and the end frame number of reproduction. When 402 reads the table file for search reproduction currently created beforehand and reproduces an animation from the frame of a reproduction start frame number using this table, it is a decode information reading part which outputs required decode

information. This decode information reading part 402 is the almost same composition as the decode information reader of drawing 3, and comprises the video recovery start number memory measure 403, the table reference means 404, and the record memory measure 405. 406 is a decode information memory measure which memorizes reproduction start / end frame number memorized by the decode information outputted from a decode information reading part, and reproducing section memory information as decode information, and controls decoding processing. 407 is a stream delivery means which sends out a stream, after seeking an MPEG video stream based on the decode information of the decode information memory measure 406. 408 is a video decoding means which decodes the stream sent from the stream delivery means 407 based on the decode information received from the decode information memory measure, will start a display if a playback start frame is reached, and will end decoding and a display further if the end frame of playback is reached.

[0059]Operation of compression video decoding and the display of MPEG video stream correspondence of the above composition is explained. First, the reproduction start frame number and the end frame number of reproduction inputted from the outside are memorized by the reproducing section memory measure 401. And a reproduction start frame number is outputted to the decode information reading part 402, and reproduction start / end frame number is outputted to a decode information memory measure. The decode information reading part 402 will refer to the table for search reproduction, if a reproduction start frame number is received, Two kinds of numerical values, the accumulation frame number to the GOP code required for the search reproduction from a specification frame and the offset number of bytes from the stream head to the GOP code, are read, and this is outputted as decode information. The details of operation of this decode information reading part are ending with explanation using Table 1. Reproduction start / end frame number to which the decode information memory measure 406 has been sent from the reproducing section memory measure 401, The decoding start frame number computed from the accumulation frame number to the GOP code sent from the decode information reading part 402, A total of four kinds of numerical values of the offset number of bytes from the stream head sent from the decode information reading part 402 to the GOP code are memorized as decode information. The decode information memory measure 406 is judged to be a frame still picture decoding command, when reproduction start / end frame number is the same value, When it judged with the section definition moving-image-reproduction command when it was a value from which playback start / end frame number differs, and the end frame number of playback is unfixed, after the playback start frame number was set up, and judging with a search reproduction instruction, the stream delivery means 407 and the video decoding means 408 are controlled. After the stream delivery means 407 seeks an MPEG video stream by [ to the GOP code memorized by the decode information memory measure 406 ] an offset number of bytes, it is sent out to a video decoding means. Since this stream has always begun from GOP, the video decoding means 408 starts decoding from the head of the received stream. And

a count is begun from a decoding start frame number, if a reproduction start frame number is reached, a display will be started, and if the end frame number of reproduction is reached or a stream termination is reached, decoding and a display will be ended.

However, when reproduction start / end frame number is the same value, the frame still picture data of the frame number is outputted.

A video decoding means outputs the frame number of the frame under decoding, the frame number of a frame on display, and the signal (a decoding start, an end, etc. are shown) that shows decoding and a display state to a decode information memory measure. It is also possible to output outside the decode information memorized by the decode information memory measure 406 if needed.

[0060] Thus, in compression video decoding and a display of MPEG video stream correspondence of composition like drawing 6. By using the table file for search reproduction currently created beforehand, high-speed decoding of the frame still picture of the high-speed search reproduction from an arbitrary specification frame and an arbitrary specification frame is possible. The table preparation device for search reproduction of drawing 1 may not independently be prepared, but the table preparing part for search reproduction with a function equivalent to this device may also be included in the inside of compression video decoding and the display of drawing 6.

[0061] (Embodiment 2) Drawing 7 is a lineblock diagram of compression video decoding and the display corresponding to an MPEG system stream. Drawing 7 is the almost same composition as compression video decoding and the display corresponding to the MPEG video stream of drawing 6 explained by (Embodiment 1), and the audio decoding section means is only added in connection with the difference between a video stream and a system stream. Then, only the point that drawing 6 differs from composition and operation is explained.

[0062] Compression video decoding and the display of MPEG system stream correspondence of drawing 7 comprise the reproducing section memory measure 501, the decode information reading part 502, the decode information memory measure 506, the stream delivery means 507, and the video audio synchronous reproduction part 508. The video audio synchronous reproduction part 508 comprises the synchronous means 509, the audio decoding means 510, and the video decoding means 511. After the audio decoding means 510 reads the audio stream sent out from the stream delivery means 507 and seeks it to a suitable position, it performs decoding and reproduction. The video decoding means 511 reads the video stream sent out from the stream delivery means 507, after it detects the GOP code, it starts decoding, and if it reaches a playback start frame, it will start a display. The synchronous means 509 takes the synchronization of the audio decoding means 510 and the video decoding means 511.

[0063] Since this compression video decoding and display are MPEG system stream correspondences, the table file for search reproduction created with the table preparation device for search reproduction of drawing 3 is used for it. If this table is used, both the search

reproduction on the basis of a video frame and the search reproduction on the basis of an audio frame are possible, but the search reproduction on the basis of a video frame is explained here. The information memorized by the decode information memory measure 506, Reproduction start / end frame number outputted from the reproducing section memory measure 501, The decoding start frame number computed from the number of packet inner frames and accumulation frame number which are outputted from the decode information reading part 502, They are an offset number of bytes and a relative-offset number of bytes from a pack header to a packet header absolutely from the stream head outputted from the decode information reading part 502 to a pack header. The decode information memory measure 506 is judged to be a frame still picture decoding command, when reproduction start / end frame number is the same value, When it judged with the section definition moving-image-reproduction command when it was a value from which playback start / end frame number differs, and the end frame number of playback is unfixed, after the playback start frame number was set up, and judging with a search reproduction instruction, a stream delivery means and a video decoding means are controlled. To the stream delivery means 507, an offset number of bytes and the relative-offset number of bytes from a pack header to a packet header are absolutely sent from a stream head to a pack header from the decode information memory measure 506. the stream delivery means 507 seeks a stream to a pack header first, reads the information indicated to the pack header, and outputs this to the synchronous means 509 -- the system separation start of a video audio -- it carries out. About a video packet, sending out in the video decoding means 511 from the video packet (the GOP code is included) which can be judged from the relative-offset number of bytes from a pack header to a packet header is started. About an audio packet, all the audio packets detected after the system separation start are sent out to the audio decoding means 510. Since system separation is made and the sent-out video stream is a request, a stream head is not necessarily the GOP code. Then, the video decoding means 511 analyzes the sent-out video stream per byte, and starts decoding processing from the GOP code which detected and detected the GOP code. Since the frame number of the frame just behind GOP is told from the decode information memory measure as a decoding start frame number, If a count is started and a reproduction start frame number is reached from this frame number, a display will be started, and if the end frame number of reproduction is reached, decoding and a display will be ended. The decoding start frame number and reproduction start / end frame number which are used at this time are acquired from the decode information memory 506 via the synchronous means 507. In the midst of performing video decoding and a display, an audio decoding means detects the audio frame (AAU) corresponding to a video presentation start frame number, starts decoding and playback from the frame, and ends audio decoding and playback synchronizing with the end of video recovery. The synchronous means 507 controls the synchronous reproduction of video and an audio. When playback start / end frame number is the same value, a video decoding means outputs the frame still picture data of the

frame number. At this time, the stream delivery means 407 cannot send out an audio packet, and the audio decoding means does not operate. Since the information on a pack header is not needed, an offset number of bytes and the relative-offset number of bytes from a pack header to a packet header are absolutely added from a stream head to a pack header. Only the number of bytes may seek a stream and system separation may be started from the video packet containing the GOP code in the position. The time of video recovery without audio reproduction, and also when the synchronous reproduction of a strict video audio is not required, such a stream seek method may be adopted. It is also possible to output outside the decode information memorized by the decode information memory measure 506 if needed. Although not indicated in a figure, a video audio synchronous reproduction part, The frame number of the frame under decoding, the frame number of a frame on display, and the signal (a decoding start, an end, etc. are shown) that shows decoding and a display state are outputted to the decode information 506, and the decode information memory measure 506 also combines this information, and is memorized as decode information. [0064] Thus, in compression video decoding and a display of MPEG system stream correspondence of composition like drawing 7. By using the table file for search reproduction currently created beforehand, high-speed decoding of the frame still picture of the high-speed search reproduction from an arbitrary specification frame and an arbitrary specification frame is possible. The table preparation device for search reproduction of drawing 2 may not independently be prepared, but the table preparing part for search reproduction with a function equivalent to this device may also be included in the inside of compression video decoding and the display of drawing 7. When performing search reproduction on the basis of an audio frame, the decode information reading part of a function equivalent to the decode information reader of drawing 3 is prepared, and it has composition which can input the audio reproduction section.

[0065] (Embodiment 3) Drawing 8 is a lineblock diagram of compression video decoding and the display which can carry out file creation of the index image. This device has search refreshable compression video decoding and the indicator which has a function equivalent to drawing 6, or compression video decoding and the display of drawing 7 in an inside. The scene change detection result file on which this device has recorded the result of having detected the break of the scene in an animation stream by a certain method, Using the table for search reproduction created with the table preparation device for search reproduction of drawing 2, the still picture of the head of each scene is decoded out of a compression video stream, and the still picture group is summarized to one file, and is outputted. The still picture of this scene head assumes being used as an index picture by which a list display is carried out at the time of search and an inspection of a compression video stream.

[0066] Drawing 9 is an example of a scene change detection result file, made the lot the head frame number and final frame number of each scene, and the format which enumerates scene information is

taken. However, the method of obtaining this scene change detection result is not asked. As long as the format which records a scene change detection result is defined beforehand, things other than drawing 9 may be used for it.

[0067]The index graphics file preparation device of drawing 8 comprises a scene change information storage means, search refreshable compression video decoding and an indicator, a frame still picture memory measure, a header preparing means, and a file creation means. Each part in drawing 6 is explained in order. 601 reads the scene change detection result file which has recorded the result of having detected the break of the scene in an animation stream by a certain method, It is a scene change information storage means which memorizes the scene change information indicated to the file, and outputs the frame number of a scene head as a reproduction start / end frame number one by one. 602 An MPEG video stream or an MPEG system stream, They are search refreshable compression video decoding and the indicator which decodes a stream according to the frame reproducing section which used the table file for search reproduction corresponding to the stream, and was inputted from the scene change information storage means. The frame still picture outputted from search refreshable compression video decoding and the indicator 602 is reduced or compressed, and 603 memorizes it temporarily, and is a frame still picture memory measure outputted to a sequential-file preparing means. 604 is a header information preparing means which creates the header information added to an index graphics file, and memorizes this from the decode information outputted from search refreshable compression video decoding and the indicator 602. 605 is a file creation means to gather the frame still picture data currently recorded on the header information currently recorded on the header preparing means 604, and the frame still picture memory measure 603, and to create an index graphics file.

[0068]Operation of the index picture preparation device of the above composition is explained. First, a scene change detection result file is read into the scene change information storage means 601. However, only the frame number of each scene head currently recorded on the scene change detection result file is good. The frame number of each of this scene head is outputted to search refreshable compression video decoding and the indicator 602, and the decode information memory measure 603. However, both the reproduction start frame numbers and reproduction start frame numbers that are inputted into search refreshable compression video decoding and the indicator 602 are set as a scene head frame number. Since reproduction start / end frame number is the same value, search refreshable compression video decoding and the indicator 602 decode and output the frame still picture of the frame number, and outputs decode information to the header preparing means 604 simultaneously with this. This search refreshable compression video decoding and indicator 602 are equivalent to drawing 6, or compression video decoding and the display of drawing 7, and is properly used according to the target stream kind. The frame still picture memory measure 603 performs reduction or compression processing in a frame for a still picture, and memorizes this temporarily. However, a decoded image may be



memorized as it is. The header preparing means 604 creates the header of the index graphics file using the decode information outputted from search refreshable compression video decoding and the indicator 602. In the file creation means 605, the frame still picture data memorized by the frame still picture memory measure 603 is written in the same file one by one. About the frame number of all the scene heads memorized by the scene change information storage means, the above processings are performed, and finally, the file creation means 605 adds the header information created by the header preparing means 410 to an index graphics file, and ends processing.

[0069]Drawing 10 is an example of an index graphics file. In this example, each index graphics file compounded from the compression video stream is reduced to a suitable size, and this is summarized to one file. Each index picture can compute the size from those same with size, the width and the height of a picture, and a format, and random access is possible. In the index graphics format description column, the code which distinguishes the format type defined beforehand is described. The information description columns, such as a frame number in a compression video stream, are provided. If needed, it is made to correspond to each index picture, and a scene head, the last frame number, the field that writes in the keyword for search, etc. are provided.

[0070]The device of drawing 9 can be adapted for both an MPEG video stream and an MPEG system stream, if search refreshable compression video decoding and the indicator 602 are changed. This device is an example adapting drawing 6, or compression video decoding and the display of drawing 7, and is characterized by being the composition which can decode the arbitrary frame still pictures contained in a stream at high speed. Although the reason for creating the index picture beforehand is in order to shorten the time which an index picture list display takes at the time of an inspection and search, and because the keyword for search is added to each scene in an index graphics file and a visual search means is provided, As long as there are high-speed compression video decoding and display, the method of decoding a frame still picture from a compression video stream if needed may be adopted.

[0071](Embodiment 4) Drawing 11 is a lineblock diagram of compression video decoding with an index image list display function, and a display, and comprises an index image list display means, a reproducing section determination means, and search refreshable compression video decoding and an indicator.

[0072]Each part in drawing 11 is explained in order. 701 is an index picture list display means which receives the command from a user, reads the index picture in an index graphics file according to an index image display command, and carries out the list display of this. 702 is a reproducing section determination means to determine a reproducing section according to the selected index picture. 703 is search refreshable compression video decoding and an indicator.

[0073]Operation of compression video decoding with an index image list display function and the display of the above composition is explained. First, according to the command from a user, the index picture list display means 701 reads an index graphics file, and

carries out the list display of the index picture. A user chooses one index picture or two or more continuous index pictures from the index pictures by which the list display is carried out. Here, the video regeneration method which a user can specify is made into two kinds, search reproduction and section reproduction. Are reproduction a regeneration method to continue until search reproduction performs reproduction from the specified index, and requires a reproduction stop command or it reaches to a stream termination, and section reproduction, It is a regeneration method which performs reproduction from the head frame number of the scene corresponding to the ordered index picture to the end frame number of a scene. Therefore, when one index is chosen, search reproduction or section reproduction is possible, and when two or more continuous indexes are chosen, it becomes section reproduction automatically. If a user performs index picture selection and regeneration method specification, the index picture list display means 701 will determine reproduction start / end frame according to the specification, and will output it to a reproducing section memory measure. However, the head and end frame number information on the scene corresponding to each index shall be recorded on the index graphics file. The reproducing section memory measure 702 outputs memorized reproduction start / end frame number to search refreshable compression video decoding and the indicator 703, and search refreshable compression video decoding and the indicator 703 use the table file for search reproduction, and it reproduces a compression video stream.

[0074]This device uses the index graphics file created with the index picture preparation device of drawing 9, makes an index picture the still picture group contained in a stream, carries out a list display, and has composition in which the compression video search reproduction from the index picture which the user chose is possible. Any of an MPEG video stream and an MPEG system stream may be sufficient as a compression video stream.

[0075](Embodiment 5) Drawing 12 is a lineblock diagram of index image decoding, compression video decoding with a list display function, and a display, and comprises a scene change information storage means, a decoding control means, search refreshable compression video decoding and an indicator, a display information control means, and an index list display means. Since it is the same composition as compression video decoding with an index image list display function and the display of drawing 11 of (Embodiment 4), it explains focusing on a different point from it.

[0076]Each part in drawing 12 is explained in order. 801 is a scene change information storage means which reads a scene change detection result file, memorizes this, and generates a frame still picture decoding command or a moving-image-reproduction command according to a command from a user. 802 is a decoding control means which distinguishes a frame still picture decoding command and a moving-image-reproduction command, and controls decoding processing. 803 is search refreshable compression video decoding and an indicator. 804 is a display information control means which distinguishes a frame still picture decoding command and a moving-image-reproduction command, and performs a frame

still picture display, an index image list display, and animation display. 805 is an index image display means which aligns and displays the decoded frame still picture.

[0077]Operation of compression video decoding with an index image list display function and the display of the above composition is explained. First, the scene change information storage means 801 reads a scene change detection result file. This file divides a compression video stream into two or more scenes, and records the head frame number of each scene, and a final frame number. If a user issues an index image display command, the scene change information storage means 801 will output the head frame number of a scene to the decoding control means 802 with a frame still picture decoding command. The head frame of two or more scenes which continue also by the head frame of all the scenes may be sufficient as the index picture which carries out a list display. That decoding of the still picture of the head frame of one scene finished, Since it can check by the decode information which search refreshable compression video decoding and the indicator 803 output, the scene change information storage means 801 outputs the head frame number of the following scene, whenever decoding of one frame finishes. If the decoding control means 802 has an output of a frame number from a scene change information storage means, Reproduction start / end frame number is outputted to search refreshable compression video decoding and the indicator 803, and control of search refreshable compression video decoding, the indicator 803, and the display information control means 804 is performed. Let reproduction start / end frame number in this case be a frame number of a scene head. According to the output from the decoding control means 802, search refreshable compression video decoding and the indicator 803 decode a frame still picture, and outputs this to the display information control means 804. The display information control means 804 outputs frame still picture data to the index picture list display means 805. An index picture list display means reduces the frame still picture sent one by one, and displays this in line. If the still picture of a scene head is decoded and the list display of this is carried out according to scene change information, the index list display means 805 will be in a moving-image-reproduction command receivable state. A user's selection of an index picture will output the information about the index picture chosen from the index picture list display means 805 as the scene change information storage means 801. This information is for connecting the selected index picture and the scene in scene change information. The scene change information storage means 801 determines reproduction start / end frame number with reference to scene change information and the selected regeneration method (search reproduction or section reproduction), and outputs a moving-image-reproduction command to the decoding control means 802. The decoding control means 802 outputs reproduction start / end frame number to search refreshable compression video decoding and the indicator 803, and performs control of search refreshable compression video decoding, the indicator 803, and the display information control means 804. According to the output from the decoding control means 802, search refreshable compression video decoding and the indicator 803 decode a stream, and outputs the data

from a reproduction start frame to the end frame of reproduction to the display information control means 804. The display information control means 804 displays the received decode data as an animation.

[0078] This device does not need to create an index graphics file beforehand, and the scene change detection result file on which the scene information in a compression video stream is recorded is used, Decode the scene head image in a stream and it has a function which makes this an index image and carries out a list display, It can respond to both an MPEG video stream and an MPEG system stream by being characterized by the search reproduction from still more arbitrary index images being possible, and changing search refreshable compression video decoding and the indicator 803.

Although omitted in explanation, when aimed at an MPEG system stream, synchronizing with video recovery, reproduction of an audio can also be performed simultaneously. Corresponding to an index image, the function to perform decoding and reproduction of only an audio may be added. Search refreshable compression video decoding and the indicator 803 may be replaced with what can respond to both an MPEG video stream and an MPEG system stream. In that case, it becomes search refreshable compression video decoding and the indicator which combined the function of drawing 6, and compression video decoding and the display of drawing 7.

[0079] (Embodiment 6) Drawing 13 is a compression video simple editing device for editing an index picture. (It is defined also as it being simple edit to edit an index image.) Explained compression video decoding and the display (embodiment 5), It is possible to decode the still picture of the head frame of each scene from a compression video stream, and to carry out the list display of this using the information currently recorded on the scene change detection result file. The scene change detection result file used in that case detects the portion from which the contents of the image change with a certain methods, and records the result divided into two or more scenes. In this work, since a big labor is needed for carrying out via a help, various automatic scene change detecting methods are developed until now. However, since they are not the scene segmentation after understanding the contents of the image, there is a field insufficient in accuracy. The compression video simple editing device of drawing 13 is because the defect of automatic scene change detection is compensated, a scene change result file is edited and suitable index information is provided by a user.

[0080] Since there are many portions which overlap with the composition of compression video decoding and the display explained by (Embodiment 5), the compression video simple editing device of drawing 13 is explained focusing on a different point from it. The compression video simple editing device of drawing 13, The frame number calculating means 901, the scene change information storage means 902, the scene change information editing means 903, the decoding control means 904, search refreshable compression video decoding and an indicator 905, the display information control means 906, the reproduction frame information storage means 907, It comprises the index picture list display means 908 and the

reproducing section determination means 909. The moving-image-reproduction control means which controls moving image reproduction is omitted out of the figure. This moving-image-reproduction control means is for receiving the command of reproduction, a stop, a halt, etc. of the video from a user, and controlling decoding and reproduction of compression video.

[0081]The frame number calculating means 901 receives the detailed frame image display command from a user, computes the frame number corresponding to the command, and generates a frame still picture decoding command. Here, the list display of the continuous frame image which begins from the specified frame number, or the frame image thinned out in beginning regular intervals from the specified frame number is carried out to a detailed frame image. When this changes and adds an index picture, it is a function for making a new index picture easy to choose. For the same reason as this, search refreshable compression video decoding and the indicator 905 may be added for the top delivery regenerative function of a forward direction and an opposite direction, etc. The decoding control means 904 distinguishes the means which inputs reproduction start / end frame number, and generates a frame still picture decoding command or a moving-image-reproduction command according to it. The reproduction frame information storage means 907 memorizes the frame number under reproduction included in the decode information outputted from search refreshable compression video decoding and the indicator 905. The index picture list display means 908 performs not only the list display of an index picture but the list display of a detailed frame image. According to the index image editing command from a user, the scene change information editing means 903 edits scene change information, and the result is reflected in the scene change information storage means 902 and the index picture under list display. In that case, the frame number of a new index picture and the deleted index picture is acquired from the reproduction frame information storage means 907 or the reproducing section determination means 909. A scene change information editing means shall also have the function to register the keyword for search, for every scene.

[0082]The editing instruction from a user has three kinds such as deletion, change, and an addition of an index picture. A user sends an index deleting instruction, after choosing one index picture from the index picture by which the list display is carried out to delete an index picture. At this time, the scene change information editing means 903 unifies the scene information corresponding to the deleted index picture, and the scene information in front of one of them. It is a means of choosing one frame image from the detailed FUREMU picture by which the list display is carried out, or suspending the video currently reproduced in a suitable place, and after determining the frame still picture to add, index addition instructions are sent to add an index picture. At this time, the scene change information editing means 903 divides the scene information containing the added frame image into two bordering on the added frame. Index picture change means change of a scene boundary, and becomes combination about deletion and an addition. However, a user shall be provided with suitable GUI for performing these operations.

[0083]Drawing 14 shows signs that a scene change detection result file is corrected, in connection with an index image editing. In the original scene change detection result file, there are ten scenes of the scene A to the scene J. This was edited, the scene B and the scene E were deleted, the boundary of the scenes D and F was changed, the scene H was divided, and the scene x and the scene y are added.

Drawing 15 is an example of the edited scene change detection result file, and the registered keyword for search is recorded following the start frame of each scene, and the end frame. This keyword is used for scene search.

[0084](Embodiment 7) Drawing 16 is a compression video simple editing device. Simple edit means the editing method which creates the file which recorded only compilation information rather than saves an edit result as a new compression animation stream.

Although it is not suitable for fine edit, when changing an order of the comparatively longer scene which are scattered in two or more compression video streams and reproducing, it is thought that it is effective. At the time of reproduction, the simple-edit-information file on which the simple edit result is recorded will be read, and section reproduction of a compression video stream will be successively repeated for the stream file name and scene start / end frame number (namely, reproducing section) which are recorded on the file as reading.

[0085]Since the almost same composition as the compression video simple editing device for editing the index picture of drawing 13 is carried out, the compression video simple editing device of drawing 16 is explained focusing on a different point. The device of drawing 16, The frame number calculating means 1001, the scene change information storage means 1002, the scene change information editing means 1003, the decoding control means 1004, search refreshable compression video decoding and an indicator 1005, the display information control means 1006, the reproduction frame information storage means 1007, It comprises the index list display means 1008, the reproducing section determination means 1009, and the simple editorial department 1010. Among these, the simple editorial department comprises the edit result displaying means 1011 and the simple-edit-information file creation means 1012. It differs from the device of drawing 13 in that the simple editorial department 1010 is added.

[0086]At the time of simple editing work, the simple editorial department 1010 in drawing 16, the index picture list display means 1008, and the reproducing section determination means 1009 mainly operate. The editing instruction inputted from the outside is told to the index picture list display means 1008 and the simple-edit-information file creation means 1012. An editing instruction has a reproducing section index picture selection instruction and a reproducing section index picture alignment command. A reproducing section index picture selection instruction is a command which chooses the index picture equivalent to a scene to reproduce. Here, the selected index picture will be called a reproducing section index picture. A reproducing section index picture alignment command is a command which determines the reproduction

sequence of two or more reproducing section index pictures.

[0087]Next, the operation at the time of simple edit of the device of drawing 16 is explained. The edit result displaying means 1011 reproduces the index picture chosen from the index image group in which the list display is carried out by the index picture list display means 1008, and displays this on a viewing area (window) new as a reproducing section index picture. If a reproducing section index picture is chosen, the reproducing section determination means 1009 will ask for scene reproduction start / end frame number corresponding to the index picture, and will output this to the simple-edit-information file creation means 1012. It is [ two or more ] selectable in a reproducing section index picture, and according to reproduction sequence, the list display of two or more selected reproducing section index pictures is carried out in line. The well order of a reproducing section index picture can be changed, and the information about the well order (namely, reproduction sequence) of a reproducing section index picture is outputted to the simple-edit-information file creation means 1012. Change of well order, and an addition and deletion of a reproducing section index picture shall be provided with suitable GUI. The simple-edit-information preparing means 1012 creates a simple-edit-information file based on the information about reproduction start / end frame number outputted from the reproducing section determination means 1009, and the reproduction sequence outputted from the edit result displaying means 1011. Under the present circumstances, when the keyword for search and a scene title are registered, these are added to a simple-edit-information file. Thus, the compression video simple editing device of drawing 16 can create the simple-edit-information file for reproducing in order of a request of two or more scenes to reproduce in addition to correction of the index picture itself.

[0088]Drawing 17 is a key map of simple edit. The user (editor) is shown the index picture list display window and the simple editing window. Since an index picture will be reproduced if the index picture equivalent to the scene which a user wants to use a mouse etc. and to reproduce is clicked, the reproduced index picture is dropped with a simple editing window. This work is repeated and the reproducing section index picture in a simple editing window is rearranged in order of a request. Rearrangement work shall also be done with a mouse. Since the repair capability of the index picture itself also occurs, the compression video simple editing device of drawing 16 uses this if needed. If a moving-image-reproduction window is prepared, it can work checking a simple edit result.

[0089]Drawing 18 is an example of a simple edit result file, and supports drawing 17. The left-hand side of drawing 18 is a scene change detection result file. When a user chooses the index picture of the scene A, M, and J, K, and D and wishes reproduction in this order out of this file, therefore the index picture from the scene A to the scene O by which the list display was carried out, a simple-edit-information file as shown in the right-hand side of drawing 18 is created. In this example, the keyword for search and the scene title are added corresponding to each scene.

[0090]By extending the compression video simple editing device of drawing 16, it is also possible to create the simple-edit-information

file containing the scene of two or more compression video streams. Drawing 19 is a key map of the simple edit in the case of editing a multi-file at once, and drawing 20 is an example of the simple edit result file corresponding to it. In this case, a user is shown the index picture list display window for the number of the compression video stream of an editing object, and the simple editing window of a piece. A user chooses freely two or more index pictures in two or more compression video streams, and determines the reproduction sequence. A compression video stream file name is recorded on the simple-edit-information file created with start / end frame number and the keyword for search of each scene.

[0091]A reproducing section index picture may be reduced (or compression), it may collect into one, simple edit information may be added to this as a header, and an index graphics file with simple edit information may be created. If this index graphics file with simple edit information is used, it is possible to decode and display the head image of each scene at high speed, and to shorten the response time to a user.

[0092](Embodiment 8) Drawing 21 is compression video decoding and the display based on a simple-edit-information file. Since it is constituting mostly with index image decoding, compression video decoding with a list display function, and the display of drawing 12, the composition of this device is explained focusing on a different point from this. The device of drawing 21 comprises the simple-edit-information memory measure 1101, the file management means 1102, the decoding control means 1103, search refreshable compression video decoding and an indicator 1104, a display information control means, 1105, and the index image list display means 1106. It differs in that the file which reads the device of drawing 12 is not a scene change detection result file but a simple-edit-information file. Since the scene of two or more compression video streams is contained, a file management means to manage a compression video stream and its attachment file is added to this simple-edit-information file.

[0093]First, the simple-edit-information memory measure 1101 reads a simple-edit-information file, and outputs the video file name corresponding to a scene to file management information. According to this, the Phi AI management tool will be in the demanded compression video stream and a state accessible to the table file for search reproduction. However, the table file name for search reproduction corresponding to the stream shall be specified from a compression video stream file name. The simple-edit-information memory measure 1101 outputs reproduction start / end frame number of a frame still picture decoding command and each scene to the decoding control means 1103. It can be checked that decoding of one frame has been completed by the decode information which search refreshable compression video decoding and the indicator 1104 output. If only the number of scenes in simple edit information repeats this processing successively, the list display of the still picture of the head frame of each scene will be carried out as an index picture. And if one index picture is chosen from this index picture by which the list display is carried out, the information which specifies the selected index picture will be outputted to a simple-edit-



information memory measure. Then, a simple-edit-information memory measure outputs reproduction start / end frame number of scene \*\* corresponding to a moving-image-reproduction command and the selected index image to the decoding control means 1103. However, there are a search reproduction instruction and a section reproduction instruction in a moving-image-reproduction command, and this is chosen by the user. After this, it passes in the same process as the device of drawing 12, and moving image reproduction from an index picture is performed.

[0094] Thus, compression video decoding and the display of drawing 21 can display [ decoding and ] continuously two or more scenes which are scattered in two or more compression video stream based on a simple-edit-information file, and is possible for decoding and the display from the index image which carried out the list display of the head frame of each scene, and there is.

[0095] (Embodiment 9) Drawing 22 is compression video decoding with a retrieval-by-keyword function, and a display. Since it is constituting mostly with compression video decoding and the display based on the simple-edit-information file of drawing 21, the composition of this device is explained focusing on a different point from this. The device of drawing 22, It comprises the retrieval-by-keyword means 1201, the file management means 1202, the scene change information storage means 1203, the decoding control means 1204, search refreshable compression video decoding and an indicator 1205, the display information control means 1206, and the index image list display means 1207. The file management means 1202 manages the attachment file with a compression video stream. By the keyword for stream search and the keyword for scene search which are inputted from the outside, the retrieval-by-keyword means 1201 performs retrieval by keyword, and displays search results. These search results are added to text-based information, including a stream name, a scene frame number, etc., and the still picture of a scene head frame, etc. are contained. The method of carrying out direct retrieval of the file with a keyword registered area may be used for this retrieval by keyword, and the method of searching the keyword control file which is carrying out batch management of all the keywords of all the files may be used for it. A user is shown search results and they are memorized by the scene change information storage means. And using this scene change information, the scene head frame in a stream is made into an index picture, and a list display is carried out. The user can check search results as an animation immediately, if the index picture which wishes to reproduce is chosen from the index picture by which the list display is carried out. Search by the keyword of not only the keyword of a compression video stream unit but a scene unit is possible for the device of drawing 22, and search results can be shown visually. Although the simple-edit-information file is not indicated, it may enable it to perform retrieval by keyword, an index picture list display, and moving image reproduction also including this file in a figure.

[0096] (Embodiment 10) Drawing 23 and drawing 24 are client-server compression video decoding and a display. Drawing 23 is a

server apparatus and drawing 24 is a client apparatus.

Fundamentally, this device is carrying out the same composition as compression video decoding with a retrieval-by-keyword function and the display of drawing 22. A greatly different point is a point that write in client-server composition and search refreshable compression video decoding and an indicator are divided into two. A server apparatus sends out a stream to a client side with decode information, after seeking a stream according to a search reproduction request. A client apparatus performs decoding and a display of the stream which received based on decode information. [0097]The server apparatus of drawing 23 comprises the retrieval-by-keyword means 1301, the file management means 1302, the stream transmission section 1303, the scene change information storage means 1308, and the command discriminating means 1309. Among these, the stream transmission section 1303 comprises the reproducing section memory measure 1304, the decode information reading part 1305, the decode information memory measure 1306, and the stream delivery means 1307. It is in agreement with the thing excluding the video audio synchronous reproduction part from compression video decoding and the display of drawing 7. 1309 distinguishes the command from a client, controls the retrieval-by-keyword means 1301 and the scene change information storage means 1308, and answers to the command from a client. The server side communication control means 1310 controls communication with a client, receives the command from a client, and transmits a compression video stream etc. according to this.

[0098]On the other hand, the client apparatus of drawing 24 comprises the command transmission control means 1401, the decoding control means 1402, the video audio synchronous reproduction part 1403, the display information control means 1404, the index image list display means 1405, and the client side communication control means 1406. Among these, the video audio synchronous reproduction part 1403 is the same as the video audio synchronous reproduction part of compression video decoding and the display of drawing 7. The command transmission control means 1401 distinguishes the retrieving instruction from a user, an index image display command, a moving-image-reproduction command, etc., and transmits a command to the server side according to this. The client side communication control means 1406 controls communication with a server, transmits a command to a server, and receives a compression video stream etc.

[0099]By combining the server apparatus of drawing 23, and the client apparatus of drawing 24, a function can be equally exhibited with compression video decoding with a retrieval-by-keyword function and the display of drawing 22. There is the feature of this client-server compression video decoding and display in sending out a stream, after [ which should start decoding at the time of the frame specification search reproduction from the stream middle, and decoding of the frame still picture contained in a compression animation stream ] carrying out a stream detecting position. Although the MPEG system was targeted in the upper explanation, it can respond to an MPEG video stream only by carrying out the

partial change of the equipment configuration. An equipment configuration may be changed so that it can respond to both an MPEG video stream and an MPEG system stream.

[0100]

[Effect of the Invention]As mentioned above compression video decoding and the display of this invention, Since the table file for search reproduction currently created beforehand is used, the high-speed search reproduction from a specification frame has the operation that high-speed search reproduction of the compressed difficult compression video stream is possible, like MPEG which is international standards of a video coding mode. Compression video decoding and the display of this invention, and a compression video simple editing device, The operation that only the scene which provided the function which makes the scene head image in a stream an index picture, and carries out a list display, and the user wished is immediately renewable, Without creating the new compression video stream as an edit result, the file which recorded only the edit result is created and it has the operation that this file group \*\*\*\*\* moving image reproduction is possible.

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[Translation done.]